3.8 ENERGY AND NATURAL RESOURCES

Additional and updated information about the availability and potential impacts on natural resources has been added to the Final EIS. The Final EIS also notes that the Chehalis Power Station began operation since the publication of the Draft EIS. The revised information about energy and natural resources does not affect the conclusions of the section as presented in the Draft EIS.

3.8.1 Existing Conditions

- On Page 3.8-4 of the Draft EIS, Table 3.8-4 should be deleted and replaced with the following:

Table 3.8-4: Washington Generation Facilities Currently Under Construction

Facility	Developer	Facility Type	Size (MW)	Expected On-Line Date
Chehalis Power Station [1]	Tractebel Power, Inc.	Comb Cycle	520	Qtr. 3/2003
Coyote Springs 2	Avista	Comb Cycle	260	Qtr. 3/2003
Goldendale	Calpine Corp.	Comb Cycle	248	Qtr. 2/2004
Satsop CT Project	Duke Energy	Comb Cycle	650	Construction Suspended

Source: PSE 2003

1 - Station has begun operation since the publication of the Draft EIS.

3.8.1 Existing Conditions

- On Page 3.8-10 of the Draft EIS, the following text and table should be added after the third paragraph.

Overall, the North American natural gas resource base is feeling the effects of its maturity, with production from conventional wells flattening out since the mid 1990s, and non-conventional gas resources making up the balance (National Petroleum Council 2003 and U.S. Department of Energy 2004). The Energy Information Administration (EIA) forecasts that by 2025, 43% of total production in the lower 48 states of the U.S. would be met by unconventional resources. Table 3.8-7 summarizes U.S. natural gas supply projections developed by the California Energy Commission and the EIA.

Table 3.8-7: Projected Natural Gas Supplies for the United States (in trillion cf/yr)

Supply Sources	Projected 2003	Projected 2008	Projected 2013	Projected 2025 AEO2004
Lower 48	18.664	20.277	21.746	21.29
Canada	4.209	4.503	4.853	2.56
Other sources[1]	1.200	1.887	2.688	4.68[2]
Total	24.072	26.668	29.368	31.41

Source: California Energy Commission 2003, U.S. Department of Energy 2004.

1 Other sources include: fuel available from fuel switching, liquefied natural gas (LNG) receipt at existing U.S. import facilities, and Mexican imports; assumes no new LNG facilities, but expansion of existing facilities as LNG imports become a more cost effective resource.

2 Includes LNG and imports from Mexico

In the short term, it is expected that overall declines in U.S. production from the lower 48 states will be made up through development of non-conventional resources and increased production from the Rocky Mountain region as noted above. The National Petroleum Council (NPC) has projected that in the longer term (2025), production from the lower 48 states and non-arctic Canada would only make up 75% of U.S. demand. The EIA and the NPC have concluded that the balance of supply would come from the most cost-effective combination of the following resources:

- Development of Canadian Arctic Gas: The MacKenzie Delta natural gas pipeline is projected to begin moving supplies to U.S. buyers in 2009, with maximum annual throughput of 675 billion cubic feet reached in 2012 and continuing through 2025. However, it is also expected that a significant portion of the gas production of the Mackenzie Delta fields would be consumed within Canada.

- Liquid Natural Gas (LNG) Imports: Supplies of natural gas from oversea sources, imported through U.S. liquefied natural gas terminals, account for most of the projected increase in net imports in both the EIA and NPC forecasts. It is projected that expansion of LNG capacity would occur through both expansion of the four existing facilities in the U.S. (three on Atlantic seaboard, one on the Gulf Coast) and development of new facilities. As of December 1, 2003, there were 32 proposals for new terminals; however, proposals for new capacity involve significant risk and uncertainty both within and outside the U.S. and are not all expected to move forward.

- Development of U.S Arctic Gas: Both the U.S. Department of Energy (2004) and NPC forecasts project the development of North Slope Alaska fields, with operation beginning only after 2015. Although the potential of the Alaska gas resource is known to be large, uncertainty surrounds its development because the resource is stranded from the U.S. market, public opposition, and regulatory factors.

3.8.2 Impacts of the Proposed Action

- On Page 3.8-12 of the Draft EIS, Table 3.8-7 should be changed to Table 3.8-8.

- On Page 3.8-13 of the Draft EIS, Table 3.8-8 should be changed to Table 3.8-9.
- On Page 3.8-14 of the Draft EIS, Table 3.8-9 should be changed to Table 3.8-10.
- On Page 3.8-15 of the Draft EIS, Table 3.8-10 should be changed to Table 3.8-11.
- On Page 3.8-15 of the Draft EIS, the fourth paragraph should be deleted.

3.8.3 Impacts of No Action

- The last paragraph on Page 3.8-16 and the first paragraph on Page 3.8-17 should be deleted and replaced with the following text.

Under the No Action Alternative, the cogeneration facility, refinery interface, 230-kV transmission facility, and other project components would not be constructed and the consumption of energy or natural resources associated with construction and operation of the project would not occur. Existing natural-gas-fired power plants would be more likely to continue operations. No new hydroelectric generating capacity is being added, and the development of nuclear power plants has been halted. Wind and solar power do not have the generating availability needed to meet continuous electrical demand, but they could allow more flexibility in managing baseload resources. Fuel cell technologies are being developed, but these remain relatively small and expensive. Natural-gas-fired, combined-cycle combustion turbine plants would meet the increasing demand for baseload electrical generation. If the proposed cogeneration facility were not constructed, the refinery and industries in the region would use electricity produced by existing sources of generation, electricity produced by other new sources of generation, or through regional user-side electricity efficiency savings.

Under this alternative, the cogeneration facility would not generate and transmit electrical power for use on the Northwest power grid. The No Action Alternative would not remove the need for power production; it would potentially transfer the impacts to another site and another technology. There would be no increase in the power supply reliability for the BP Cherry Point Refinery and no contribution to new electrical generation required to meet increasing power demands in the Pacific Northwest and adjoining regions.

3.8.4 Secondary and Cumulative Impacts

- On Page 3.8-17, the second, third, and fourth paragraphs should be deleted and replaced with the following text and table.

Natural Gas Supply and Consumption

The project would consume 42,457,356 MBtu (approximately 43 MDth) of natural gas annually in the production of electrical energy and steam. The proposed project would incrementally contribute to the regional demand for natural gas and, given existing natural gas transmission system capacity in the region, would represent an additional increment of demand on the system. The cogeneration facility's projected annual natural gas consumption would be relatively small compared to the region's existing and projected future supply, and it would not be expected to significantly affect the overall supply for other users in northwest Washington.

Cumulative impacts on natural gas consumption from the development of this and other gas-fired electrical generation facilities would depend mainly on market forces, regional and national economic growth, and the response of this and other industrial sectors who are large consumers of natural gas and/or electricity. It is anticipated that shifts in the industrial market will accommodate tightening natural gas supplies in a number of ways.

Recent data from the Energy Information Administration (EIA 2004) has indicated a dramatic increase in additions to U.S. electricity generation capacity since 2000, with virtually all of the new capacity using natural gas as fuel. However, natural gas consumption in the electric power sector has not increased as rapidly. From 1995 to 2002, natural-gas-fired generation in the power sector increased by 43%, but natural gas consumption in the power sector increased only 31%. This reduced consumption relative to generation can be attributed to increased efficiency of natural-gas-fired generation. The significant role of natural gas fuel in power generation is expected to continue in the foreseeable future, but the disparity between generating capacity added and natural gas use is also expected to grow for the following reasons.

The modest rate of growth of electricity sales will mean that many of the new facilities are unlikely to operate at full capacity in their early years of operation. Also, as clearly evidenced in the Pacific Northwest in the past 24 months, market forces will dictate the number of new facilities that will actually be constructed and operated (California Energy Commission 2003). Table 3.8-12 summarizes the recent status of natural gas generation (greater than 25 MW) in the Pacific Northwest region (WECC 2004) and clearly indicates a direct decrease in projects being developed due to the weak regional economy and the short term decrease in regional electricity consumption.

Table 3.8-12: Summary of Proposed Combustion Turbine Facilities in the Pacific Northwest

Facility	County	Location	Technology	Output (MW)	Est. Operational Date	Company
Operating Facilities						
Evander Andrews (Mt Home)	Elmore	Idaho	Gas Turbine	90	10/1/2001	Idaho Power Company
Rathdrum	Kootenai	Idaho		270	9/1/2001	Avista/Cogentrix
Exxon I	Yellowstone	Montana	Gas Turbine	20	4/1/2001	Exxon
Albany Cogeneration	Linn	Oregon	Cogen	85	7/1/2000	Willamette
Beaver GT	Columbia	Oregon	Gas Turbine	24	7/1/2001	Portland General Electric
Coyote Springs II	Morrow	Oregon	Combined	280	7/1/2003	Avista/Mirant
Hermiston	Umatilla	Oregon	Combined	530	8/20/2002	Calpine
Hermiston Peaking	Umatilla	Oregon	Combined	100	8/20/2002	Calpine
Klamath Falls Cogeneration	Klamath	Oregon	Combined	500	7/1/2001	PacifiCorp
Klamath Falls Expansion	Klamath	Oregon	Gas Turbine	100	6/1/2002	Pacific Klamath Energy
Morrow Power GT	Morrow	Oregon		25	8/1/2002	Morrow Power
SP Newsprint Cogen	Yamhill	Oregon	Combined	130	7/1/2003	SP Newsprint
Benton PUD (Finley)	Skagit	Washington	Gas Turbine	27	12/20/2001	Benton PUD
Big Hanaford (Centralia)	Lewis	Washington		248	7/1/2002	TransAlta
Boulder Park	Spokane	Washington		25	4/1/2002	Avista
BP Cherry Point GTs	Whatcom	Washington	Gas Turbine	73	9/1/2001	Cherry Point Refinery
Chehalis Generation	Lewis	Washington	Combined	520	10/1/2003	Tractebel
Equilon GTs	Skagit	Washington	Gas Turbine	38	1/1/2002	Equilon Enterprises
Frederickson	Pierce	Washington		249	8/1/2002	EPCOR & Puget Sound Energy
Fredonia Addition	Skagit	Washington	Gas Turbine	106	8/1/2001	Puget Sound Energy
Pasco GTs	Franklin	Washington	Gas Turbine	44	6/30/2002	Franklin/Grays Harbor PUD
Pierce Power	Pierce	Washington	Gas Turbine	154	9/1/2001	TransAlta
SUBTOTAL				3,638		
Facilities Under Construction						
Frederickson Expansion	Pierce	Washington		25	6/1/2005	EPCOR & Puget Sound Energy
SUBTOTAL				25		
Regulatory Approval Received						
Bennett Mountain		Idaho	Peaker[1]	162	7/1/2005	Idaho Power
Silver Bow	Silver Bow	Montana	Combined	500	1/1/2011	Continental Energy Services

1 A facility that operates during peak power demands.

Table 3.8-12: Continued

Facility	County	Location	Technology	Output (MW)	Est. Operational Date	Company
Port Westward	Columbia	Oregon	Combined	650	4/1/2006	Portland General Electric
Summit/Westward	Columbia	Oregon	Combined	520	4/1/2006	Westward Energy LLC
Umatilla Generation Project	Umatilla	Oregon	Combined	610	3/31/2008	PG&E Natl Energy
Frederickson Power 2	Pierce	Washington	Combined	300	1/1/2011	EPCOR & Puget Sound Energy
Sumas 2 Generating Facility	Whatcom	Washington	Combined	660	1/1/2011	National Energy
Wallula	Walla Walla	Washington	Combined	1,350	1/1/2011	Newport Generation
SUBTOTAL				4,752		
Under Review						
Rathdrum GT to CC Conversion	Kootenai	Idaho	Combined	90	9/1/2005	Avista
Basin Creek	Silver Bow	Montana	Reciprocating Engines	48	1/1/2011	Basin Creek Power
COB Energy Facility	Klamath	Oregon	Combined	1,150	6/1/2005	Peoples Energy
Klamath Generating Facility	Klamath	Oregon	Combined	500	1/1/2011	PacifiCorp Power Marketing
Turner	Marion	Oregon	Combined	620	1/1/2011	Calpine
Wanapa Energy Center	Umatilla	Oregon	Combined	1,230	1/1/2011	Eugene Water & Elec
West Cascade Energy Facility	Lane	Oregon		600	12/31/2007	Black Hills Corp
BP Cherry Point	Whatcom	Washington	Combined	720	6/1/2006	Cherry Point Refinery
Plymouth Generating Facility	Benton	Washington	Combined	306	1/1/2011	Plymouth Energy
Tahoma Energy Center	Pierce	Washington	Combined	270	1/1/2011	Calpine
SUBTOTAL				5,534		
Cancelled, Denied Permit, or Delayed Indefinitely						
Garnet Energy Facility I	Canyon	Idaho	Combined	273		Ida-West
Garnet Energy Facility II	Canyon	Idaho	Combined	262		Ida-West
Kootenai	Kootenai	Idaho	Combined	1,300		Newport Generation
Mountain Home (PDA)	Elmore	Idaho	Gas Turbine	104		Power Development Association
Rathdrum II	Kootenai	Idaho	Combined	500		Cogentrix
Montana First Megawatts	Cascade	Montana	Combined	250		Northwestern Corp

Table 3.8-12: Continued

Facility	County	Location	Technology	Output (MW)	Est. Operational Date	Company
Coburg	Lane	Oregon	Combined	605		Coburg Power
Columbia River Energy	Columbia	Oregon	GT	44		Columbia River Energy
Grizzly Power Project	Jefferson	Oregon	Combined	980		Cogentrix
Morrow	Morrow	Oregon	Combined	550		PG&E Natl Energy
Pope & Talbot Cogen (Halsey)	Linn	Oregon	Gas Turbine	93		Oregon Energy
St Helens Cogen	Columbia	Oregon	Combined	141		Oregon Energy
West Linn Paper	Clackamas	Oregon	Combined	94		West Linn Paper
Cowlitz Cogeneration project	Cowlitz	Washington	Combined	395		Weyerhauser
Everett Delta 1 (Preston Point)	Snohomish	Washington		496		FPL Energy
Goldendale	Klickitat	Washington	Combined	248		Calpine
Goldendale NW (The Cliffs)	Klickitat	Washington	Gas Turbine	190		Goldendale NW Alum
Longview Power Station	Cowlitz	Washington	Combined	245		Enron
Mercer Ranch	Benton	Washington	Combined	850		Cogentrix
Mint Farm	Cowlitz	Washington	Combined	286		Mirant
NW Regional Power (Creston)	Lincoln	Washington	Combined	838		Northwest Power Ent
Satsop (Grays Harbor Phase l)	Mason	Washington	Combined	650		Duke Energy NA
Satsop ll (Grays Harbor Phase ll)	Mason	Washington	Combined	600		Duke Energy NA
Sedro-Wooley	Skagit	Washington	Gas Turbine	83		Tollhouse Energy
Starbuck	Columbia	Washington	Combined	1,200		PPL Global
SUBTOTAL				11,277		
Press Release Only						
Black Hills	Hill	Montana		80		Black Hills Power
Blackfeet	Glacier	Montana		160		Adair
Indigenous Global		Washington		1,000		Indigenous Global
Port Frederickson Industrial	Pierce	Washington		324		Morgan Stanley
SUBTOTAL				1,564		
GRAND TOTAL				26,790		

Source: Database of Proposed Generation within the Western Electricity Coordinating Council, February 2, 2004.

New gas-fired electrical generation is significantly more efficient that existing and older gas-fired and oil-fired generation. Whereas older facilities are only 33% or less efficient, newer gas-fired facilities are 45% to 50% efficient. Combined heat and power facilities such as the proposed BP cogeneration project are even more efficient. This efficiency of gas will lead power companies to retire older, less efficient plants, thereby reducing the amount of natural gas consumed per MW of electricity produced.

Finally, the price of natural gas relative to other fuels and the cost effectiveness of new natural gas supplies will determine how much gas will be consumed by the gas-fired electrical generation sector as a whole. The tight balance of supply and demand that is forecast for the next 20 years, associated with the maturing natural gas resource in the U.S. and Canada, will emphasize the cost effectiveness of new gas resources being developed, including liquefied natural gas imports, Arctic gas development in both the U.S. and Canada, and the development of non-conventional gas resources. The cost of the gas produced through these and existing conventional resources will influence the energy sector's natural gas market share in consumption. The generation sector will switch to cheaper fuels as allowed by environmental constraints or make fuller use of gas supply from the new sources (National Petroleum Council 2003 and U.S. Department of Energy 2004).

Electrical Generation

The project would use 146,325 MWh of electrical power annually to generate electricity and steam. However, the overall impacts of electrical energy use would not be significant compared to the total amount of energy being produced by the proposed facility. Operation of the cogeneration facility would cumulatively add to the availability of energy in the Pacific Northwest by generating up to 635 MW of electrical power for distribution on the Northwest power grid.

Other Resources

Approximately 176,850 cubic yards of sand, gravel, fill dirt, and concrete, and 1,050 tons of steel would be used to construct the cogeneration facility, representing an incremental contribution to the regional consumption of these resources. Total permitted gravel resources in Whatcom County are estimated to be approximately 55.2 million tons. The proposed project would use less than 0.05% of these permitted sources in Whatcom County and would not result in a significant cumulative impact on these resources.